

Remarks

This amendment is submitted along with a Request for Continued Examination (RCE) of the present application under 37 CFR 1.114. A request for a three-months extension (a one-month extension and a two months extension having already been requested) and the associated fee (for a three-months extension minus the fee for the first and second months extension) accompanies this amendment.

Please do not enter the previous amendments filed June 6, 2006; July 21, 2006 and August 23, 2006 submitted in response to the Final Rejection in this application, but enter this amendment in their place.

Review and reconsideration of this application are respectfully requested in view of this amendment.

Claims 3-7, 9 and 20 are canceled by this amendment, and 11-19 were previously canceled. Claims 1, 2, 8, 10 and 21-22 were previously presented, and claims 23-26 are newly added by this amendment.

Support for the amendments to the specification can be found in the specification at page 5, line 11 and page 6, line 13, respectively.

No new matter has been added as a result of the amendments to the claims.

In accordance with the Final Rejection, the amendments made in claims 1-3, 8, 10, 21 and 22 in the amendment filed January 5, 2006 (Amdt.A) have been received and considered by the Examiner.

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claim 20 is objected to as being improperly marked up, but correctly labeled as “(previously Presented)”. In view of the cancellation of claim 20, this objection can now be withdrawn.

Applicant notes and appreciates the examiner’s withdrawal of the previous objection to claim 22 due to Applicant’s amendment in claim 22 in Amdt A.

Repeated Rejections**Claim Rejections – 35 U.S.C. § 103**

The rejection of claims 1-4, 6-10 and 20-22 made of record in paragraph 8 of the previous Office Action mailed October 5, 2005 has been repeated for the reasons previously made of record and for the following reasons that address the amendment made in claims 1 and 10 (for the record, it is noted that the previous rejection of claims 1-4, 6-10 and 20-22 was under 35 U.S.C. 102(b) rather than the present rejection under 35 U.S.C. 103).

In regard to claims 1, the examiner again asserts that the tubular structure of Igarashi et al. (5,223,571) exhibits heat tolerant characteristics because Igarashi et al. teach that the tubular structure is heat resistant (col. 2, lines 50-54). Any hose is resistant to some degree of pressure, so the hose of Igarashi et al. necessarily exhibits pressure resistant characteristics. The tubular structure of Igarashi et al. exhibits hydrocarbon fluid impermeability characteristics since Igarashi et al. teach that the tubular structure is gas impermeable (col. 2, lines 50-53). In further regard to claim 1, the tubular structure of Igarashi et al. comprises a vinyl ester copolymer matrix (ethylene-vinyl acetate copolymer, col. 3, lines 32-35 and col. 4, lines 22-26) where the vinyl ester copolymer matrix contains greater than 40% vinyl ester based on the weight of the copolymer (col. 3, lines 48-51).

In regard to claim 10, Igarashi et al. teach that the tubular structure is for

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conveying refrigerant in car coolers, air conditioners and other refrigerant-using devices (col. 2, lines 54-57), a teaching which falls within the scope of the fluids in an automotive engine cooler, transmission oil cooler, power transmission cooler, radiator or heater. The tubular structure of Igarashi et al. comprises an ethylene-vinyl acetate copolymer matrix (col. 3, lines 32-35 and col. 4, lines 22-26).

New Rejections**Claim Rejection – 35 U.S.C. § 112**

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation “consisting essentially of an ethylene-vinyl acetate copolymer matrix” in line 4 of the claim is contradictory to the language of lines 4-7 of the claim, which requires about 40 to 55% of one or more additives chosen from the seven categories of additives recited in the remainder of the claim.

Examiner's Response to Applicant's Previous Arguments

Applicant's arguments regarding the 35 U.S.C. 102 rejection of the claims presented on page 9-17 of the previous amendment A have been fully considered but are not persuasive.

On pages 9-10 of Amendment A, applicant argues that saponified ethylene-vinyl acetate is not ethylene-vinyl acetate; however, since Igarashi et al. recommends that the degree of saponification be at least 90%, in instances where the degree of saponification is less than 100%, the tubular structure comprises vinyl acetate copolymer matrix as claimed in claim 1. The teaching of Igarashi et al. that the heat resistance “tends to be lowered to an insufficient level” is inconclusive and therefore does not teach away from applicant's claimed subject matter.

In regard to applicant's discussion regarding the CPA resin of Igarashi et al. on page 10 of amendment A, claim 1 does not exclude another resin, such as CPA resin from

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the scope of the claim.

In regard to applicant's discussion regarding claims 4-6 on pages 10-13 of amendment A, in instances where the degree of saponification is less than 100%, the tubular structure comprises vinyl acetate copolymer matrix as claimed in claim 1.

Applicant's argument regarding claims 7-9 depends entirely upon applicant's arguments regarding the rejection to claim 4.

On pages 13-16 of amendment A, applicant argues that saponified ethylene-vinyl acetate is not ethylene vinyl acetate; however, since Igarashi et al. recommends that the degree of saponification be at least 90%, in instances where the degree of saponification is less than 100%, the tubular structure comprises vinyl acetate copolymer matrix as claimed in claims 10 and 20. The teaching of Igarashi et al. that the heat resistance "tends to be lowered to an insufficient level" is inconclusive and therefore does not teach away from applicant's claimed subject matter.

Response to the New Rejection

In regard to the 35 U.S.C. 112 rejection of claim 10, applicant submits that such rejection can now be withdrawn in view of the above amendment in claim 10.

Response to rejections and Examiner's Comments

In regard to claim 1, applicant has amended claim 1 wherein the present tubular structure now consists essentially of; about 30 to 70% by weight of an ethylene-vinyl acetate copolymer matrix; up to about 50% by weight of a polymeric material selected from the group consisting of the specific polymers that were defined in claim 9 (now canceled); and about 25 to 70% by weight of one or more additives selected from the

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group consisting of the specific additives that were defined in claim 7 (now canceled), wherein the ethylene-vinyl acetate copolymer matrix has a vinyl acetate content of greater than about 40%;

Igarashi et al., on the other hand, teach a refrigeration transport hose comprising an inner tube comprising a refrigerant gas-impermeable resinous layer formed of a very specific polyamide resin produced by the reaction of hexamethylene diamine and an aliphatic dicarboxylic acid having eight to sixteen carbon atoms (CPA resin); an outer rubber layer; and a reinforcing fiber layer between the inner layer and the outer layer. Igarashi et al have found that common polyamides resins are not suitable, and that only the specific polyamide resin produced by condensation of hexamethylene diamine and an aliphatic dicarboxylic acid whose molecule has 8 to 16 carbon atoms is satisfactory, in regard to the three requirements (of their invention), i.e., high gas impermeability, flexibility and heat resistance (col. 2, lines 33-43). In one embodiment, the inner layer contains 100% of the CPA resin (col. 3, lines 30-31). In a second embodiment, the inner layer further contains a saponified ethylene-vinyl acetate copolymer in addition to the CPA resin (col. 3, lines 32-34).

Applicant submits that simply because the saponified ethylene-vinyl acetate copolymer contains pendent acetate groups does not make the polymer an ethylene vinyl acetate copolymer. Nor does the saponification of an ethylene-vinyl acetate copolymer provide a polymeric mixture of ethylene-vinyl acetate copolymer and ethylene-vinyl alcohol copolymer. Once the saponification has occurred, the resulting polymer product is either an ethylene-vinyl acetate-vinyl alcohol terpolymer or an ethylene-vinyl alcohol copolymer, depending on the degree of saponification. Applicant contends that chemically and structurally, ethylene-vinyl acetate copolymers and saponified ethylene-vinyl acetate copolymers are distinctly different from one another. Ethylene-vinyl acetate copolymer has the structure (1):



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(1)

while saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer where less than all of the pendant acetate groups are converted, i.e., saponification is less than 100%) has the structure (2):



(2)

When saponification is 100% where all of the pendant acetate groups have been converted to hydroxyl groups, the saponified ethylene-vinyl acetate copolymer is polyvinyl alcohol. As shown in structure (2), the polymer chain contains "m-n" acetate groups and also contains "n" hydroxyl groups, and the resulting polymer is an ethylene-vinyl acetate-vinyl alcohol terpolymer. The numerical values of the numerals "m-n" and "n" are determined by the degree of saponification. When the value of "n" is equal to the value of "m", saponification has reached 100% and there is no longer any pendant acetate groups present in the polymer chain; therefore, the resulting polymer is an ethylene-vinyl alcohol copolymer. When the value of "m" is larger than "n" and "n" is not zero, the resulting polymer is ethylene-vinyl acetate-vinyl alcohol terpolymer (structure 2). Where "n" is zero, the polymer is not a saponified ethylene-vinyl acetate copolymer. Igarashi et al recommends that the saponified ethylene-vinyl acetate copolymer contain not more than 40 mol % of ethylene and not less than 90 mol % vinyl acetate of the ethylene-vinyl acetate be saponified (col. 3, lines 39-42). A person skilled in the art would recognize the distinctions between a saponified ethylene-vinyl acetate copolymer and an ethylene-vinyl acetate copolymer and, furthermore, such person skilled in the art would understand that the two polymers have different characteristics and properties, in addition to having different structures. Actually, Igarashi et al desires that not less than 90% of the vinyl acetate of the ethylene-vinyl acetate copolymer is saponified. If the degree of saponification of the vinyl acetate is below 90 mol % the heat resistance of the product formed of the resinous composition tends to be lowered to an insufficient level (col. 3,

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lines 39-47). As seen from structure (2) above, ethylene-vinyl acetate-vinyl alcohol terpolymers where the numerical value of the numeral "n" is nearly equal to the numerical value of "m", i.e., the saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer) contains relatively few pendant acetate groups compared to the relatively high number of pendant hydroxyl groups. Such example is exemplary of a saponified ethylene-vinyl acetate copolymer where the saponification is relatively high, e.g., greater than about 90 mol %.

Applicant contends that Igarashi et al clearly indicates that, as the degree of saponification of the vinyl acetate is decreased, whereby the ethylene-vinyl acetate-vinyl alcohol terpolymer contains a greater number of vinyl acetate pendant groups relative to the number of vinyl alcohol pendant groups, the heat resistance of the structure tends to be lowered as a result. Contrary to the Examiner's opinion, Applicant believes that such disclosure would more likely than not, lead a person skilled in the art away from employing an ethylene-vinyl acetate copolymer as a tubular structure (claims 1, 2 and 8) or hose (claims 10 21-24) as presently claimed.

Furthermore, as stated earlier Igarashi et al. requires the presence of a CPA resin which must be employed either with or without the saponified ethylene-vinyl acetate copolymer. In view of the above amendments wherein claims 1 and 10 have been amended to recite the term "consisting essentially of" language, applicant submits that the present claims exclude the presence of a CPA resin.

The examiner asserted earlier that the tubular structure of Igarashi et al. exhibits hydrocarbon fluid impermeability characteristics since Igarashi et al. teach that the tubular structure is gas impermeable. Applicant's response to the Examiner's allegation was merely to suggest that gas impermeability does not necessarily translate to hydrocarbon fluid impermeability. However, gas does relate to the state of the material and, in the application of Igarashi et al., the gas is used for cooling such as in refrigeration and air conditioning devices. Such devices typically employ fluorocarbons or other materials in the form of gas. It is noted that Igarashi et al. do not refer to their

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tubular structure as being liquid impermeable. In the Advisory Action mailed June 20, 2006, the Examiner suggests that Applicant's statement that "[g]as relates to the state of the material" is unsupported and that Applicant has not provided convincing evidence showing that Igarashi et al. intends "gas" to refer solely, or at all, to "the state of the material". In this regard, Applicant refers to "The American Heritage Dictionary of the English Language, new College Edition" which defines "gas" as "[t]he state of matter distinguished from the solid and liquid states...", and further to "Hawley's Condensed Chemical Dictionary, Twelfth Edition", which defines "gas" as "a" state of matter...". Accordingly, applicant submits that the present invention is neither anticipated nor obvious over the teachings of Igarashi et al. In any case, Applicant believes that the present claims as amended herein are neither anticipated nor obvious over the cited references

The Examiner's attention is directed to claims 1, 10 and 20 where applicant has amended those claims to specifically claim a tubular structure "comprising:" (1) a matrix material which is defined as "consisting essentially of" ethylene-vinyl acetate copolymer; and (2) one or more additives. Therefore, the claims now define a tubular structure "comprising" a polymeric matrix material and one or more additives, wherein the matrix material "consists essentially of" an ethylene-vinyl acetate copolymer. Such terminology now excludes the presence of a saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer) and the CPA resin of Igarashi et al. Since Igarashi et al. specifically require the presence of a CPA (a specific polyamide resin produced by condensation polymerization of hexamethylene diamine and an aliphatic dicarboxylic acid whose molecule has 8 to 16 carbon atoms) resin, or a CPA resin further containing saponified ethylene-vinyl acetate copolymer, applicant submits that the present claims are neither anticipated nor obvious over the teachings of Igarashi et al.

The gas impermeable resinous composition of Igarashi et al. contains not more than 250 parts by weight of the saponified ethylene-vinyl acetate copolymer per 100 parts by weight of the CPA resin (Col. 3, lines 48-51). In contradistinction to the resinous composition of Igarashi et al., the tubular structure of the present invention does not

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contain the "CPA" resin defined by Igarashi et al as a specific polyamide resin produced by condensation polymerization of hexamethylene diamine and an aliphatic carboxylic acid whose molecule has 8 to 16 carbon atoms (col. 2., lines 35-38).

In regard to claim 2, applicant submits that the ethylene-vinyl acetate copolymer tubular structure of the present invention is neither anticipated nor rendered obvious by the patent to Igarashi et al. as argued above. Furthermore, since claim 2 merely recites further limitations of a base claim that is considered allowable, applicant submits that dependent claim 8 also is neither anticipated nor rendered obvious by the patent to Igarashi et al. Therefore, this rejection of claim 2 should be withdrawn.

With respect to claim 8, applicant submits that the ethylene-vinyl acetate copolymer tubular structure of the present invention is neither anticipated or rendered obvious by the patent to Igarashi et al. as argued above. Furthermore, since claim 8 merely recites further limitations of a base claim that is considered allowable, applicant submits that dependent claim 8 also is neither anticipated nor rendered obvious by the patent to Igarashi et al. Therefore, this rejection of claim 8 should be withdrawn.

With respect to claim 9, claim 9 has been canceled by this amendment. Therefore, the rejection of claim 9 is moot.

With respect to claim 10, applicant contends that the present hose comprises about 45 to 60% of an ethylene-vinyl acetate copolymer matrix material consisting essentially of an inner tubular member, a reinforcement member on the inner tubular member, and a cover on the reinforcement member, wherein the inner tubular member consists essentially of; about 30 to 75% by weight of an ethylene-vinyl acetate copolymer matrix wherein the ethylene-vinyl acetate copolymer matrix has a vinyl acetate content greater than about 40% and the ethylene-vinyl acetate copolymer matrix is blended with up to about 50% by weight of a polymeric material selected from the group consisting of ethylene-propylene-diene terpolymer (EPDM), styrene-butadiene rubber (SBR), acrylonitrile-butadiene rubber (NBR), ethylene-propylene rubber (EPR), butyl rubber,

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cis-polybutadiene, cis-polyisoprene, polyurethane, and mixtures thereof; and about 25 to 70% by weight of one or more additives selected from the group consisting of process aids, fillers, plasticizers, metal oxides, metal hydroxides, peroxides, coagents, antioxidants and combinations thereof.

Claims 11-19 have been canceled as being directed to a non-elected invention.

With respect to the rejection of claim 20, claim 20 has been canceled. Therefore, the rejection of claim 20 is moot.

With respect to claim 21, applicant submits that since the ethylene-vinyl acetate copolymer tubular structure of claim 1 is considered to be neither anticipated or rendered obvious by the patent to Igarashi et al. as argued above, claim 21 which merely recites further limitations of the base claim, applicant submits that claim 21 also is neither anticipated nor rendered obvious by the patent to Igarashi et al. Therefore, this rejection should be withdrawn.

With respect to claim 22, applicant submits that since the ethylene-vinyl acetate copolymer tubular structure of claim 1 is considered to be neither anticipated or rendered obvious by the patent to Igarashi et al. as argued above, claim 22 which merely recites further limitations of the base claim, applicant submits that claim 22 also is neither anticipated nor rendered obvious by the patent to Igarashi et al. Therefore, this rejection should be withdrawn.

Newly added claims 23 and 24 correspond to dependent claims 2 and 8, respectively, and are considered to be patentable over the cited references

Summary

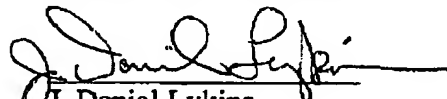
Applicant contends that Igarashi et al teach a gas impermeable resinous composition formed from a very specific polyamide produced by condensation polymerization of hexamethylene diamine and an aliphatic carboxylic acid whose molecule has 8 to 16 carbon atoms (CPA) as the resinous matrix. The resinous matrix may be 100% CPA or the resinous matrix may contain a saponified ethylene-vinyl acetate copolymer in addition to the CPA. It is noteworthy that Igarashi et al. make an intentional and purposeful effort to saponify the ethylene-vinyl acetate copolymer to the

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extent that greater than 90% of the vinyl acetate units are saponified in order to provide a resinous material of which would be effective for his particular purpose. As argued and illustrated above, a saponified ethylene-vinyl acetate copolymer has a structure that is distinctly different from an ethylene-vinyl acetate copolymer. The structure of 100% saponified ethylene-vinyl acetate copolymers provides an extremely long chain of ethylene units and interconnected pendent vinyl alcohol units resulting from the 100% saponification of all of the vinyl acetate units; and the structure of the less than 100% saponified ethylene-vinyl acetate copolymers provides an extremely long chain of ethylene units, interconnected pendent vinyl alcohol units resulting from the saponification of some of the vinyl acetate units, and some unaffected pendent vinyl acetate units that remain vinyl acetate because not all of the vinyl acetate units are saponified. Applicant submits that the structure of the 100% saponified ethylene-vinyl acetate copolymer (ethylene-vinyl alcohol copolymer) and the structure of the less than 100% saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer) are distinctly different from ethylene-vinyl acetate copolymers of the present invention and, in the absence of evidence to the contrary, one could not predict the behavior of an ethylene-vinyl acetate copolymer based upon the known behavior of an ethylene-vinyl alcohol or an ethylene-vinyl acetate-vinyl-alcohol terpolymer in a specific environment which may be the same or different. Accordingly, one structure neither anticipates nor obviates the other structure.

In view of the forgoing amendments and remarks, it is believed that the present application is now in condition for allowance and an early indication thereof is earnestly solicited.

Respectfully Submitted,


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